

IN THE CLAIMS

The following claim listing replaces all prior claim listings:

1-17. (Cancelled)

18. (Currently Amended) A system for reforming diesel fuel into hydrogen comprising:

feeds for water and diesel fuel;

a supercritical water (SCW) reactor in fluid communication with said water feed and said diesel fuel;

at least one pump in fluid communication with said diesel fuel feed and configured to pressurize said diesel fuel feed to a predetermined pressure at or greater than the critical pressure of water before the water and the diesel fuel are mixed;

at least one pre-heater in thermal communication with said water feed and said diesel fuel feed and configured to heat water from said water feed and diesel fuel from said diesel fuel feed to a predetermined temperature equal to or greater than the critical temperature of water before the water and the diesel fuel are mixed;

a water-gas shift (WGS) reactor; and

a hydrogen capturing system;

wherein,

water and diesel fuel are fed by said feeds to said SCW reactor at said predetermined temperature via said at least one pre-heater[[:]],

wherein said water is placed into a supercritical state within said SCW reactor[[:]],

wherein, said SCW reactor reforms said diesel fuel into a synthesis gas comprising a mixture of hydrogen and carbon monoxide and outputs said synthesis gas; wherein said synthesis gas output by said SCW reactor is fed into said WGS reactor which converts said carbon

monoxide into carbon dioxide and hydrogen and outputs an output gas including a higher percentage of hydrogen to carbon monoxide compared to said synthesis gas[:]), and

~~wherein~~ said hydrogen in said output gas is captured by said hydrogen capturing system.

19. (Original) The system of claim 18 wherein said capturing system captures said hydrogen in a chemical hydride.

20. (Original) The system of claim 19 wherein said chemical hydride is sodium hydride.

21. (Original) The system of claim 19 wherein said chemical hydride is boron hydride.

22. (Original) The system of claim 18 wherein oxygen is fed into said SCW reactor in conjunction with said diesel fuel and said water.

23. (Original) The system of claim 22 wherein said oxygen is fed as a component of air.

24. (Previously Presented) The system of claim 18 further comprising a sensor and control system for monitoring at least one of said synthesis gas and said output gas and adjusting said feeds based on said sensing.

25. (Original) The system of claim 24 wherein said sensor and control system comprises a gas chromatograph.

26. (Currently Amended) A system for generating hydrogen from hydrocarbons comprising:

means for pressurizing a diesel fuel feed to a pressure equal to or greater than the critical pressure of water before diesel fuel is mixed with water;

means for preheating diesel fuel and water to a temperature equal to or greater than the critical temperature of water before the water and the diesel fuel are mixed;

means for creating a mixture of the preheated diesel fuel, the preheated water, and air;

means for taking said mixture and increasing pressure and temperature to make said water supercritical;

means for obtaining a synthesis gas comprising a mixture of hydrogen and carbon monoxide from said mixture of the preheated diesel fuel, the preheated water, and air;

means for increasing the percentage of hydrogen in said synthesis gas; and

means for capturing said hydrogen in a form useful as fuel for a fuel cell.

27. (Currently Amended) A system for reforming jet fuel into hydrogen comprising:

feeds for water and said jet fuel;

a supercritical water (SCW) reactor in fluid communication with said water feed and said jet fuel;

at least one pump in fluid communication with said jet fuel feed and configured to pressurize said jet fuel feed to a predetermined pressure at or greater than the critical pressure of water before the water and the jet fuel are mixed;

at least one pre-heater in thermal communication with said water feed and said jet fuel and configured to heat water from said water feed and jet fuel from said jet fuel feed to a predetermined temperature equal to or greater than the critical temperature of water before the water and the jet fuel are mixed;

a water-gas shift (WGS) reactor; and

a hydrogen capturing system;

wherein,

water and jet fuel are fed by said feeds to said SCW reactor at said predetermined temperature via said at least one pre-heater[(:)],

wherein said water is placed into a supercritical state within said SCW reactor;

wherein, said SCW reactor reforms said diesel fuel into a synthesis gas comprising a mixture of hydrogen and carbon monoxide and outputs said synthesis gas[(:)],

wherein said synthesis gas output by said SCW reactor is fed into said WGS reactor which converts said carbon monoxide into carbon dioxide and hydrogen and outputs an output gas including a higher percentage of hydrogen to carbon monoxide compared to said synthesis gas[(:)], and

wherein said hydrogen in said output gas is captured by said hydrogen capturing system.

28. (Previously Presented) The system of claim 27 wherein said jet fuel is JP-8 fuel.

29. (Previously Presented) The system of claim 27 wherein said capturing system captures said hydrogen in a chemical hydride.

30. (Previously Presented) The system of claim 29 wherein said chemical hydride is sodium hydride.

31. (Previously Presented) The system of claim 29 wherein said chemical hydride is boron hydride.

32. (Previously Presented) The system of claim 27 wherein oxygen is fed into said SCW reactor in conjunction with said diesel fuel and said water.

33. (Previously Presented) The system of claim 32 wherein said oxygen is fed as a component of air.

34. (Previously Presented) The system of claim 27 further comprising a sensor and control system for monitoring at least one of said synthesis gas and said output gas and adjusting said feeds based on said sensing.

35. (Previously Presented) The system of claim 34 wherein said sensor and control system comprises a gas chromatograph.

36. (New) The system of claim 18 wherein the pump is in fluid communication with the water feed and the diesel fuel feed and is configured to pressurize said water feed to a predetermined pressure at or greater than the critical pressure of water.

37. (New) The system of claim 18 including at least one pump in fluid communication with the water feed that is configured to pressurize said water feed to a predetermined pressure at or greater than the critical pressure of water before the water and diesel fuel are mixed.

38. (New) The system of claim 26 wherein the pressurization means is configured to pressurize a water feed to a predetermined pressure at or greater than the critical pressure of water.

39. (New) The system of claim 26 including means for pressurizing a water feed to a pressure equal to or greater than the critical pressure of water before the water and the diesel fuel are mixed.

40. (New) The system of claim 27 wherein the pump is in fluid communication with the water feed and is configured to pressurize said water feed to a predetermined pressure at or greater than the critical pressure of water.

41. (New) The system of claim 27 including at least one pump in fluid communication with the water feed that is configured to pressurize said water feed to a

predetermined pressure at or greater than the critical pressure of water before the water and jet fuel are mixed.